

### **REMARKS**

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-9, and 12-15 are presently active in this case. Claims 10-11 have been cancelled by a previous amendment. The present Amendment amends Claims 1, 9, and 12-14; and adds new Claim 15 without introducing any new matter.

The outstanding Office Action rejected Claim 14 under 35 U.S.C. § 112, second paragraph, as indefinite. Claims 1-2 and 9-12 were rejected under 35 U.S.C. § 102(b) as anticipated by Lee et al. (IEEE Publication, "Recognition of Negative Emotions from the Speech Signal," University of Southern California, Los Angeles, CA, U.S.A., 2002, hereinafter "Lee"). Claim 3 was rejected under 35 U.S.C. § 103(a) as unpatentable over Lee in view of Gable et al. (U.S. Patent Publication No. 2005/0060153, hereinafter "Gable"). Claims 4-8 and 13-14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Lee in view of Brandstein et al. (JASA publication, "Microphone-Array Localization Error Estimation with Application to Sensor Placement," Brown University, Providence, Rhode Island, U.S.A., 1995, hereinafter "Brandstein").

To correct minor formalities and the clarify the feature related to the "absolute loudness," Claim 1 is amended to further recite "the absolute loudness being a loudness of the speech at a location of a source of the speech." This feature finds non-limiting support in Applicants' disclosure as originally filed, for example at p. 3, ll. 4-6, and p. 4, ll. 32-35, and in corresponding Fig. 2. Applicants' specification also recites that "[i]n prior art ... systems loudness could not be used because a speaker speaking with the same loudness appeared to speak with a different loudness depending on his distance to the microphone." Since the feature is supported by the disclosure, it is believed that no new matter has been added.

In addition, new Claim 15 is added, directed to a method for processing speech. New Claim 15 also finds non-limiting support in the disclosure as originally filed. No new matter has been added.

In response to the rejections of Claims 1-9 and 12-14 under 35 U.S.C. §§ 102(b) and 103(a), Applicants respectfully request reconsideration of these rejections, and traverse the rejections, as discussed next.

Briefly recapitulating, Applicants' Claim 1 relates to a method for processing speech. The method includes the steps of receiving a speech input of a speaker; generating speech parameters from the speech input; *determining parameters describing an absolute loudness of the speech input, the absolute loudness being a loudness of the speech at a location of a source of the speech*, and evaluating at least one of the speech input and the speech parameters using the parameters describing the absolute loudness.

As explained in Applicants' specification in a non-limiting embodiment and as mentioned above, absolute loudness could not be used as a parameter to process speech for one of emotion recognition or speaker identification in the background art, since only one speaker has been used. Also, in background art speech processing systems, the speech signal is usually *normalized* to eliminate disturbing variances of loudness, so that the absolute loudness at the source cannot be determined. (Specification, p. 5, ll. 25-29.)

Turning now to the applied references, Lee is directed to a method to automatically classify spoken utterances based on the emotional state of the speaker. (Lee, Abstract.) Acoustic features are calculated of the spoken utterances, such as the pitch and energy from the speech signal. (Lee, p. 241, col. 1, ll. 44-45.) The speech signals in Lee originate from a spoken dialogue over the phone with a machine agent of a call center application. (Lee, p. 241, col. 1, ll. 4-8.) The calculated acoustic features include many parameters defining the pitch and the energy level, such as mean value, median value, minimum, maximum, and

range. (Lee, p. 241, col. 1, ll. 53-58.) All of Lee's samples are also *normalized*, that means that the origin was shifted and scaled to 1. (Lee, p. 241, col. 2, ll. 1-5.)

From the above discussion it is evident that the cited passages of Lee fail to teach a step of determining parameters describing an absolute loudness of said speech input, the absolute loudness being a loudness of the speech at a location of a source of the speech, as required by Applicants' Claim 1. First, Lee uses a single microphone for recording, for example a telephone, and second, Lee applies a normalization filter to all the samples. In addition, Lee clearly cites that the energy level of the speech signal *as received at the microphone* is calculated. A step of determining an energy level of a speech signal recorded by a telephone, as explained in Lee, *is not* a step of determining parameters describing an absolute loudness, the absolute loudness being a loudness of the speech at a location of a source of the speech, as required by Applicants' amended Claim 1.

The reference Brandstein is directed to a method capable of predicting an error region associated with a speech-source location that is obtained by a set of microphones.

(Brandstein, Abstract.) Brandstein explains that his teachings can locate a source of speech by using a time-difference-of arrival analysis (TDOA) on several microphone channels.

(Brandstein, p. 3, starting at l. 19.) His main goal is to detect and track a moving audio source inside a reception area, for example to attenuate other speakers in the same area.

(Brandstein, p. 1, ll. 11-12, ll. 19-21.) But Brandstein is silent on a feature related to the loudness of the speech at a location of a source of the speech, as required by Applicants' Claim 1.

With respect to these teachings, the pending Office Action asserts that "[o]bviously, the array of microphones would be used to determine the parameters including loudness needed for these applications," (Office Action, p. 10, ll. 2-3.) Applicants respectfully disagree, since a mere position that a reference *could* perform or include a claimed feature is

insufficient to form a rejection based on inherency. As shown above, Brandstein does not calculate the loudness of a speech at a location of a source of the speech. The U.S.P.T.O has the burden to show "that the alleged inherent characteristic *necessarily* flows from the teachings of the applied references."<sup>1</sup> The outstanding Office Action has not met that burden and fails to provide documentary support where such feature is taught or where such feature can be inferred from. It is clear that the reference Brandstein has the capability of determining a speech source location, but Brandstein does not teach anything related to a step of determining parameters describing an absolute loudness, the absolute loudness being a loudness of the speech at a location of a source of the speech, as required by Applicants' amended Claim 1.

The reference Gable is directed to a system for speech characterization, where a speaker can be verified by collecting data from a speaker and also by collecting non-acoustic data. (Gable, Abstract.) Gable explains that parameters are extracted from acoustic data and non-acoustic EM data form a set of feature vectors used to calculate a performance. (Gable, ¶¶ [0026]-[0028].) However, Gable may thereby identify a speaker with high reliability, but fails to determine parameters describing an absolute loudness, the absolute loudness being a loudness of the speech at a location of a source of the speech, as required by Applicants' amended Claim 1.

Therefore, even if the combination of Lee, Brandstein, and/or Garble is assumed to be proper, the cited passages of the combination fails to teach every element of Applicants' amended Claim 1. Specifically, the cited passages of the combination fail to teach the

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<sup>1</sup> See MPEP 2112 (emphasis in original) (citation omitted). See also same section stating that "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic," (emphasis in original). See also In re Robertson, 49 USPQ2d 1949, 1951 (Fed. Cir. 1999) ("[t]o establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill,'" citing Continental Can Co. v. Monsanto Co., 948 F2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991); and "[i]nherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient," Id. at 1269 (citation omitted)).

loudness of the speech at a location of a source of the speech. Accordingly, Applicants respectfully traverse, and request reconsideration of, this rejection based on Lee, Brandstein, and/or Garble.

Furthermore, it is not clear from the record or from the outstanding Office Action's reasoning how Brandstein's multi-speaker system to identify a location of a targeted speech source could be incorporated into Lee's system for analyzing callers that speak to an automatic call center by a telephone. Under such a modification, Lee's system could not be used as suggested in his own teachings and motivations, since the telephone and the commercial application software of SpeechWorks could not be used, thereby defying the gist of Lee's invention. (Lee, Abstract, col. 1, ll. 20-28.) Such modification would clearly require a substantial reconstruction or redesign of the elements of Lee, and/or would change the basic principle of operation of Lee. For example, a telephone microphone could not be used. There is no evidence that a person of ordinary skill in the art would be motivated to perform such changes and redesign.<sup>2</sup>

Independent Claims 9, and 12-15 recite features that are analogous to the features recited in independent Claim 1, albeit directed to different statutory classes. Moreover, Claims 9, and 12-14 have been amended in a manner analogous to the amendment to Claim 1. Accordingly, for the reasons stated above for the patentability of Claim 1, Applicant respectfully submits that the rejections of Claims 9, and 12-15, and all associated dependent claims, are also believed to be overcome in view of the arguments regarding independent Claim 1.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in

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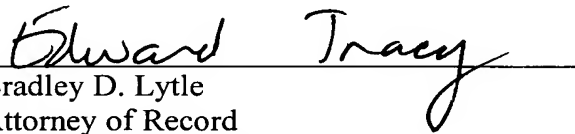
<sup>2</sup> See In re Ratti, 270 F.2d 810, 813, 123 USPQ 349, 352 (reversing an obviousness rejection where the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.")

condition for formal Allowance. A Notice of Allowance for Claims 1-9 and 12-15 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

Respectfully submitted,

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